1884MNRAS..44..153.

views of those with whom he was associated. And I may add that it is only those who enjoyed Mr. Spottiswoode's intimate friendship, as it was my privilege to do for some quarter of a century, who can know how much was lost when there vanished from among us that rare personality, so commingled of delicate sensitiveness with marvellous self-control, of rigid principle with genial tolerance, of energetic practical activity with untiring benevolence, that it always seemed to me the embodiment of that exquisite ideal of a true gentleman which Geoffrey Chaucer drew five hundred years ago. . . . It is not for me to pass judgment upon Mr. Spottiswoode's scientific labours; but I have the best authority for saying that, having occupied himself with many branches of mathematics, more especially with the higher algebra, including the theory of determinants, with the general calculus of symbols, and with the application of analysis to geometry and mechanics, he did excellent and durable work in all; and that in virtue of his sound and wide culture, his deep penetration, and the singular elegance with which he habitually treated all his subjects, he occupied a place in the front rank of English mathematicians.

"The interment in Westminster Abbey of one who, though compelled to devote a large share of his time to business, was a born man of science, and had won himself so high a place among mathematicians, was doubtless grateful to us as men of science, . . . yet as men, I think it is good to regard those solemn and pathetic obsequies as the tribute which even our busy, careless, cynical, modern world spontaneously pays to such worth and wisdom, to such large humanity and unspotted purity, as were manifested in the 'very perfect gentle knight' who so well represented the chivalry of science."

Perhaps no words could more happily express the estimation in which Mr. Spottiswoode was held by his friends.

J. W. L. G.

THOMAS WARNER was born at Leyton, Essex, on June 16, 1822, and died suddenly at Brighton on January 3, 1883. He was a younger son of the late Edward Warner, of Walthamstow, Essex, and was educated at Totteridge Park School and Trinity College, Cambridge, where he graduated in 1846. He married, in 1847, Elizabeth, youngest daughter of Richard Peckover Harris, Esq., of Walthamstow. In 1876 he published a work entitled "How to keep the Clock right by Observations of the Fixed Stars with a small fixed Telescope. Together with Tables of Stars arranged to show, by the use of a little arithmetic, the mean solar time of their apparent transits to the end of the century." This was an improved edition, the first edition having appeared in 1869. He also took considerable interest in mathematical tables and arithmetical calculations.

Mr. Warner was resident for more than thirty years at Brighton, and held the position of a justice of the peace on the

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1884MNRAS..44..153.

local bench of magistrates for many years. He will be remembered in Brighton for his active and philanthropic life and his many and munificent charities. He was a liberal supporter of the Sussex County Hospital, and had attended a meeting of its Board on the morning of the day he died. He was elected a Fellow of the Society on January 11, 1867.

THOMAS REYNOLDS WHITE died at his residence, Killingworth House, Northumberland, on May 29, 1883, after a long illness, caused by paralysis, aged 70 years. He was descended on his mother's side from an ancient Northumbrian family (the Killingworths of Killingworth), and inherited with other relatives a portion of the old lands. He possessed a taste for scientific pursuits, but had little time at his disposal to devote to them, being for many years fully engaged in business in London, as a manufacturing chemist, at Castle Street, Saffron Hill, until illness compelled him to discontinue his active interest in it. He served as one of the Local Commissioners for Finsbury for the Exhibition of 1851. He had been a member of the old Mathematical Society from his youth, on the introduction of his father, who had also been a member from early years; and he became a Fellow of this Royal Astronomical Society, with the other members of the Mathematical Society, in 1845.

ANTOINE FRANÇOIS JOSEPH YVON VILLARCEAU was born at Vendôme, Loir-et-Cher, on January 15, 1813. After having completed his education, so far as was attainable in the college of his native town, he proceeded to Paris, soon after the Revolution of 1830, full of enthusiasm for literature, art, and music. Here he continued his studies at the Conservatoire with so much success that before leaving in 1833 he obtained a first prize. Having adopted with great fervour the peculiar doctrines of Saint-Simon, he, in the same year that he quitted the Conservatoire, accompanied Félicien David to Egypt as a member of a mission of that sect, at that time stationed there under the direction of M. Enfantin. From his association with the engineer officers of that mission, especially with his friend Lambert Bey, he first obtained a taste for those branches of mathematical and mechanical science in which he afterwards became so distinguished. Returning to Paris in 1837, he became a successful student at the École Centrale, where he remained three years.

Possessed of independent means sufficient to remove all necessity for seeking immediate employment, M. Villarceau, after completing his education at the Ecole Centrale, devoted nearly all his time to the study of analysis and geometry, so that he might have readily at hand the means of investigating the higher questions in mechanics and astronomy. As the first result of this continuous study, he, in 1845, presented a memoir to the Académie des Sciences, entitled, "Méthode de correction des éléments approchés des orbites des comètes au moyen de trois

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